

REMARKS

The present application has been reviewed in light of the Office Action dated November 28, 2007. Claims 1 and 4 are presented for examination, of which Claim 1 is in independent form. Claims 2, 3, and 5-12 have been withdrawn from consideration following the restriction requirement of March 4, 2005. Claims 1 and 4 have been amended to define Applicant's invention more clearly. Favorable reconsideration is requested.

The Office Action states that Claim 1 is rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,689,339 (Ota et al.); and that Claim 4 is rejected under § 103(a) as unpatentable over Ota et al. in view of U.S. Patent No. 4,652,109 (Tsunekawa). Applicant respectfully traverses the rejections and submits that Claims 1 and 4 are patentably distinct from the cited references for at least the following reasons.

Claim 1 is directed to an image pickup apparatus that includes a plurality of pixels and an output unit. Each of the plurality of pixels includes first and second sensitive areas, such that two photoelectric conversion portions are formed in each pixel based on the first and second sensitive areas. The first sensitive area corresponds to a first light flux of light fluxes respectively corresponding to different areas of an exit pupil area of an imaging optical system, and the second sensitive area corresponds to a second light flux of the light fluxes. The output unit outputs first and second electric signals in order to detect a phase difference between the first electric signal and the second electric signal from the plurality of pixels. The first sensitive area and the second sensitive area are arranged so that each of the first electric signal and the second electric signal output by the output unit includes signals generated in the first sensitive area and the second sensitive area.

An notable feature of Claim 1 is that each pixel includes first and second sensitive areas such that two photoelectric conversion portions are formed therein. The first sensitive area and the second sensitive area are arranged so that each of a first electric signal and a second electric signal, which are output by an output unit, includes signals generated in the first sensitive area and the second sensitive area. That is, the first electric signal includes signals generated in the first and second sensitive areas. Similarly, the second electric signal includes signals generated in the first and second sensitive areas.

Ota et al. relates to an alignment apparatus for obtaining an alignment between a substrate and an exposure mask in a lithography process of a semiconductor device. The Office Action alleges that Fig. 17 of Ota et al. shows an arrangement for processing a signal generated based on light reflected from a alignment mask formed on the substrate. Specifically, it is alleged in the Office Action that a relationship between input and output signals of a signal processing system 214 reads on the output unit of Claim 1. Further, it is alleged in the Office Action that light-receiving elements 388 and 382 read on the pixels of Claim 1. The light-receiving elements have three light-receiving surfaces (a, b, and, c), which output signals corresponding respectively to diffracted lights of different orders (see, for example, column 28, lines 26-38, of Ota et al.).

Applicants submit that Ota et al. is silent regarding how each pixel of a light-receiving element is arranged, and merely describes that each light-receiving element has three surfaces. That is, Ota et al. fails to teach that two photoelectric conversion portions are formed in each pixel based on first and second sensitive areas included in the pixel. The photoelectric conversion that takes place in each of the two photoelectric conversion portions

includes a signal generated in corresponding one of the first and second sensitive areas as well as a signal generated in the other thereof.

Nothing has been found in Ota et al. that is believed to teach or suggest an image pickup apparatus that includes “a plurality of pixels each including a first sensitive area corresponding to a first light flux of light fluxes respectively corresponding to different areas of an exit pupil area of an imaging optical system and a second sensitive area corresponding to a second light flux of the light fluxes so that two photoelectric conversion portions are formed in each pixel based on the first and second sensitive areas,” and “an output unit, which outputs a first electric signal and a second electric signal, to detect a phase difference between the first electric signal and the second electric signal from the plurality of pixels,” wherein “the first sensitive area and the second sensitive area are arranged so that each of the first electric signal and the second electric signal, output by the output unit, includes signals generated in the first sensitive area and the second sensitive area,” as recited in Claim 1. Accordingly, Applicant submits that Claim 1 is not anticipated by Ota et al. and respectfully requests withdrawal of the rejection under 35 U.S.C. § 102(b).

Tsunekawa relates to a measurement system for measuring camera light. This reference is cited in the Office Action for allegedly showing a sensitivity area that is formed based on an F-number. However, nothing in Tsunekawa is believed to teach or suggest that two photoelectric conversion portions are formed in each pixel based on first and second sensitive areas included in the pixel, such that the photoelectric conversion that takes place in each of the two photoelectric conversion portions includes a signal generated in corresponding one of the first and second sensitive areas as well as a signal generated in the other thereof.

Applicant submits that a combination of Ota et al. and Tsunekawa, assuming such combination would even be permissible, would fail to teach or suggest an image pickup apparatus that includes “a plurality of pixels each including a first sensitive area corresponding to a first light flux of light fluxes respectively corresponding to different areas of an exit pupil area of an imaging optical system and a second sensitive area corresponding to a second light flux of the light fluxes so that two photoelectric conversion portions are formed in each pixel based on the first and second sensitive areas,” and “an output unit, which outputs a first electric signal and a second electric signal, to detect a phase difference between the first electric signal and the second electric signal from the plurality of pixels,” wherein “the first sensitive area and the second sensitive area are arranged so that each of the first electric signal and the second electric signal, output by the output unit, includes signals generated in the first sensitive area and the second sensitive area,” as claimed in Claim 1 from which Claim 4 depends. Accordingly, Applicant submits that Claim 4 is patentable over the cited references and respectfully requests withdrawal of the rejection under 35 U.S.C. § 103(a).

This Amendment After Final Action is believed clearly to place the present application in condition for allowance. Therefore, entry of this Amendment under 37 C.F.R. § 1.116 is believed proper and is respectfully requested, as an earnest effort to advance prosecution and reduce the number of issues. Should the Examiner believe that issues remain outstanding, it is respectfully requested that the Examiner contact Applicant’s undersigned attorney in an effort to resolve such issues and advance the case to issue.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and early passage to issue of the present application.

No petition to extend the time for response to the Office Action is deemed necessary for this Amendment. If, however, such a petition is required to make this Amendment timely filed, then this paper should be considered such a petition and the Commissioner is authorized to charge the requisite petition fee to Deposit Account 50-3939.

Applicant's undersigned attorney may be reached in our New York Office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,

/Lock See Yu-Jahnes/
Lock See Yu-Jahnes
Attorney for Applicant
Registration No. 38,667

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200